Northeast
Nuclear Energy

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The Northeast Utilities System

MAR 16 2000

Docket No. 50-336
B18032

Re: ASME Section XI
GL 90-05
10 CFR 50.55a(g)(6)(i)

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Millstone Nuclear Power Station, Unit No. 2
Relief Request from ASME Code Section XI Requirements

In a letter dated February 11, 2000,[1] Northeast Nuclear Energy Company (NNECO) requested, consistent with the guidance of Nuclear Regulatory Commission (NRC) Generic Letter (GL) 90-05, relief from the ASME Boiler and Pressure Vessel Code Section XI requirements pursuant to 10 CFR 50.55a(g)(6)(i). Attachment 1 of the above mentioned letter provided a description of actions taken by NNECO to make interim repairs on a leak in the "B" Service Water (SW) system discharge piping (line 24" -JGD-6, spool SK 923) from the Reactor Building Closed Cooling Water (RBCCW) system heat exchangers as an alternative to an IWA-4000/7000 repair/replacement. Attachment 1 also provided the supporting calculation 00-CP-02958M2, Rev. 0, "Structural Integrity Assessment of Flaw Found in Service Water Line 24"-JGD-6."

Based on the results of additional Ultrasonic (UT) examination, calculation 00-CP-02958M2 was revised to reflect the more detailed results provided by the new examination. The purpose of this letter is to provide the NRC with Revision 1 of calculation 00-CP-02958M2, "Structural Integrity Assessment of Flaw Found in Service Water Line 24"-JGD-6." The revised calculation is provided in Attachment 1.

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(1) Stephen E. Scace to The Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 2, Relief Request From ASME Code Section XI Requirements," dated February 11, 2000.

A047

As stated in our February 11, 2000, letter permanent Code repair for this flaw is scheduled for the next refueling outage, expected to begin in April 2000.

There are no regulatory commitments contained within this letter.

Should you have any questions regarding this submittal, please contact Mr. Ravi G. Joshi at (860) 440-2080.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

Stephen E. Scace
Director - Nuclear Oversight and
Regulatory Affairs

Attachment

cc: H. J. Miller, Region I Administrator
J. I. Zimmerman, NRC Project Manager, Millstone Unit No. 2
D. P. Beaulieu, Senior Resident Inspector, Millstone Unit No. 2

Docket No. 50-336
B18032

Attachment 1

Millstone Nuclear Power Station, Unit No. 2

Calculation 00-CP-02958M2, "Structural Integrity Assessment of Flaw Found in Service Water Line 24"-JGD-6," Revision 1

March 2000

Approved 9-28-99 Effective 10-5-99

CALCULATION TITLE PAGE

Total Number of Pages: 26

Structural Integrity Assessment of Flaw Found in Service Water Line 24"-JGD-6

TITLE

00-CP-02958M2	01	Service Water
CALCULATION No.	**Revision No.**	**System Name**

N/A	AB	2326A	SK0923
VENDOR CALCULATION No.	**Structure**	**System Number**	**Component**

N/A
VENDOR NAME

(1)

NUCLEAR INDICATOR: ☒CAT1 ☐RWQA ☐SBOQA ☐FPQA ☐ATWSQA ☐NON-QA	Safety Evaluation or Screen Attached ☒YES ☐NO	**Calc. Supports DCR/MMOD?** ☐YES ☒NO	**Calc. Supports Other Process?** ☒YES ☐NO

INCORPORATES:

CCN NO:	AGAINST REV.
N/A	N/A

N/A	CRED M2-00-0155
DCR/MMOD No.	**Reference**

Executive Summary

This calculation provides a structural integrity assessment of a flaw in the RBCCW piping system during plant operation. The flaw was evaluated using the linear elastic fracture mechanics guidelines provided by Generic Letter 90-05 based upon the through-wall criteria and shown to be acceptable for continued operation until the next scheduled outage. This determination included the effects of dead weight, pressure, thermal expansion and DBE.

Revision 1 of this calculation incorporates new NDE data which was not bounded by the original calculation. A review of Code minimum thickness was added and a re-evaluation of the degraded region was performed.

It should be noted that this calculation is not a justification of continued operation but addresses one aspect of the justification.

Approvals (Print & Sign Name)		
Preparer: Craig Stewart *Craig D. Stewart*		Date: 3/13/00
Interdiscipline Reviewer: N/A	Discipline:	Date:
Interdiscipline Reviewer : N/A	Discipline:	Date:
Independent Reviewer: Glenn Gardner *[signature]*		Date: 3/13/00
Supervisor: Bruce Roy *[signature]*		Date: 3/14/00

Installation Verification

☐ Calculation represents the installed configuration and approved licensing condition (Calculation of Record)

☒ N/A does not affect plant configuration (e.g., study, hypothetical analysis, etc.)

Preparer/Designer Engineer: (Print and Sign) Date:

Approved 9-28-99 Effective 10-5-99

PassPort DATABASE INPUTs

Calculation Number: 00-CP-02958M2 Revision: 01

Vendor Calculation Number/Other: N/A Revision: N/A

CCN # N/A QA ☒ Yes ☐ No Calc Voided: ☐ Yes ☒ No

Superseded By: N/A Supersedes Calc: N/A

Discipline (Up to 10) L, T, P

Unit (M1, M2, M3)	Project Reference (EWA, DCR or MMOD)	Component Id	Computer Code	Rev. No./ Level No.
M2	N/A	SK0923	N/A	N/A

PMMS CODES*					
Structure	System	Component	Reference Calculation	Rev No.	CCN
AB	SWS	PIP	79-176-250GP	06	

*The codes required must be alpha codes designed for structure, system and component.

Reference Drawing	Sheet	Rev. No.
25203-20150	106	21
25203-20194	923	6

Comments:

NOTE: Avoid multiple item references on a line, e.g., LT 1210 A-D requires four separate lines.

Table of Contents

TOTAL PAGES = 26

1.0 PURPOSE

The purpose of this calculation is to evaluate the structural integrity of a location of service water piping which was determined to have a service induced flaw. The service water line (24"-JGD-6), which is the discharge header for the reactor building component cooling water (RBCCW) heat exchangers, was determined to have a through-wall leak on the -5' elevation of the Unit 2 Auxiliary Building in the vicinity of the PMW pumps as described in CR M2-00-0155 (Reference 1). This calculation supports operation until a scheduled outage exceeding 30 days or refueling is reached and a code repair can be made.

Revision 1 to this calculation incorporates supplemental ultrasonic inspection data taken on 3/2/00. The supplemental data provides a more detailed characterization of the local degradation occurring in the vicinity of the leak.

2.0 BACKGROUND

Generic Letter 90-05 (Reference 2) provides NRC guidance regarding flaws that exceed the code acceptance limits for piping that is in service. Specifically, it permits non-code repairs to be made to Class 3 piping systems provided that, in part, adequate structural integrity can be demonstrated. Generic Letter 90-05 also provides an analytical technique based upon linear fracture mechanics for demonstrating structural integrity.

Recently, the NRC approved use of ASME Section XI, Code Case N-513 (Reference 3) as indicated in the Federal Register dated September 22, 1999 (Volume 64, Number 183, Rules and Regulations, page 51369-51400). This Code Case also provides evaluation criteria for temporary acceptance of flaws in Class 3 piping. This Code Case is limited to moderate energy Class 3 piping and is also based upon linear fracture mechanics. However, this Code Case addresses planar flaws and has limited non-planar flaw geometry size which does not encompass a hole similar to that found in the plant.

3.0 SCOPE

This calculation performs an assessment of structural integrity for the local stress conditions in line 24"-JGD-6, spool piece SK0923, at the location of the flaw. This calculation does not demonstrate design basis qualification but supports continued operation with a temporary non-structural repair. The methods employed are valid for moderate energy piping systems (design pressure < 275 psig, maximum operating temperature < 200°F).

This calculation is part of the justification for continued operation.

4.0 REFERENCES

4.1 CR M2-00-0155, dated 1/18/00.

4.2 NRC Letter, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping (Generic Letter 90-05)" dated June 15, 1990.

4.3 Case N-513, "Evaluation Criteria for Temporary Acceptance of Flaws in Class Three Piping, Section XI, Division 1," approval date August 14, 1997.

4.4 Ultrasonic Examination Straight Beam Measurements, AWO Number M2-00-00899, dated 1/19/00 (Attachment 1).

4.5 NU Calculation No. 79-176-250GP, Revision 06, "Service Water Discharge Header Problem 112," dated 8/17/99.

4.6 Ultrasonic Examination Straight Beam Measurements, AWO Number M2-00-00924, dated 1/20/00 (Attachment 2).

4.7 NU drawing 25303-20150 Sh. 106 Rev. 21, "Millstone Nuclear Power Station-Unit 2, Service Water Return From RBCCW Exchangers."

4.8 NU drawing 25303-20194 Sh. 923 Rev. 6, "Millstone Unit #2, Serv. Water Return Fr. RBCCW Exch."

4.9 USAS B31.1 - 1967, "Power Piping"

4.10 Ultrasonic Examination Straight Beam Measurements, AWO Number M2-00-03495, dated 3/2/00 (Attachment 3).

5.0 ASSUMPTIONS

5.1 The flaw geometry found represents localized corrosion with a hole like appearance extending radially from the inside surface due to a defect in the lining. The through-wall hole is relatively small but the degraded thickness extends out to an approximate diameter of 3.5 inches (Reference 4.10). A flaw of 3.0 inches will be assumed and the minimum wall thickness outside the flawed region (measured by UT and approximated as 0.62 inch) will be used as the remaining pipe wall thickness.

5.2 The flaw will be assumed to be through-wall for the 3.0 inch assumed length.

5.3 A minimum pipe thickness will be calculated based upon the stress allowable limits for primary loads. This pipe thickness will be considered in selecting the flaw length "2a". The stress levels used in the flaw evaluation will be from the analysis of record provided that the actual minimum wall thickness outside the postulated flaw area is greater than 87.5% of nominal pipe thickness.

5.4 The degraded area which has a thickness less than the required minimum wall is only approximately 1 inch in diameter. When compared to the 3 inch degraded diameter analyzed in this calculation, there is available margin to safely accommodate any further degradation that may occur prior to repair at the upcoming outage.

6.0 METHOD OF CALCULATION

The structural evaluation of the identified flaw will be performed in accordance with the guidance provided by Generic Letter 90-05. This method utilizes linear fracture mechanics to determine the crack driving force of the assumed crack size. In the case of piping, it postulates that the flaw is circumferentially oriented and the stresses are assumed to be bending stresses. The resultant "K" determined from the closed form solution is compared to a bounding critical stress intensity factor appropriate for the material.

The smallest value of t_{min} which satisfies the design stress conditions will be used to support selection of the t_{min} used in the flaw evaluation. Note, the stress allowables for each loading condition used in the determination of t_{min} were obtained from the pipe stress analysis of record (Reference 4.5). To characterize the flaw, a minimum pipe thickness (t_{meas}) for use in the fracture mechanics analysis will be established based upon the minimum pipe thickness outside the postulated flaw region.

A review of the calculated stresses at the flawed location, which include the effects of dead weight, pressure, thermal expansion and safe-shutdown earthquake, was also performed. The node which is closest to the flaw will be used to obtain the stresses and loads. The other material properties and loads required for this information will be extracted from the design calculation of record (Reference 4.5).

7.0 BODY OF CALCULATION

The equations used in determination of the applied stress intensity factor, K (ksi√in), will be computed based upon the following equations obtained from Reference 4.2 for through-wall flaws.

$$K = 1.4*s*F*(3.1416*a)^{0.5} \quad (ksi\sqrt{in})$$

where; F = the geometry factor (dimensionless)
a = the half crack length (inches)
s = the stress at the flawed location (ksi)

The geometry factor, F, is determined by the following:

$$F = 1 + A*c^{1.5} + B*c^{2.5} + C*c^{3.5}, \text{ where:}$$

the coefficients of the polynomial distribution are given by:

$$A = -3.26543 + 1.52784*r - 0.072698*r^2 + 0.0016011*r^3$$

$$B = 11.36322 - 3.91412*r + 0.18619*r^2 - 0.004099*r^3$$

$$C = -3.18609 + 3.84763*r - 0.18304*r^2 + 0.00403*r^3$$

and $c = a/(3.1416*R)$ (non-dimensional)

$r = R/t_{meas}$ (non-dimensional)

In the preceding equations for A, B and C, the variables "R" is the mean radius of the degraded pipe (inches) and the "t_{meas}" is interpreted to be the minimum thickness of the pipe outside of the assumed through-wall area. The value of "t_{min}" used to validate the sizing of the assumed hole will be established by back calculating the minimum thickness which satisfies stress limits of the design code. The ultrasonic inspection data from around the remainder of the section of the pipe will be reviewed to ensure that this criteria was met.

A summary of pertinent design information follows.

The flaw location is approximately six feet above the floor on the -5' elevation. Based upon review of the isometric drawing (Reference 4.7), the flaw location is spool piece SK-923 [JGD-6-20] (Reference 4.8).

Pipe Line No. 24"-JGD-6 (References 4.4 and 4.5 page 25)
Design Pressure = P = 100 psig (Reference 4.5 page 25)
Maximum Operating Temperature = 120°F (Reference 4.5 page 25)
Pipe Size and Schedule = 24 inch schedule 40 (Reference 4.8)

Pipe OD = 24 inches , Nominal Pipe Thickness = 0.688 inches (Reference 4.5 page 35)
Pipe Material = A 53 Gr B seamless steel pipe (Reference 4.8)

The t_{min} will be calculated based upon the design load combinations and the maximum allowable stress values.

The allowable stresses for the carbon steel A53, Gr. B pipe are (Ref. 4.5 sheet 62):

Normal:	$SE = S_h = 15{,}000$ psi, $S_c = 15{,}000$ psi
Secondary (Thermal)	$S_A = 22{,}500$ psi
Upset:	$1.2S_h = 18{,}000$ psi
Faulted:	$S_y = 34380$ psi @ 120°F

Review of the ADLPIPE model was performed to determine the correct nodal location. The vertical run of piping which contains the flaw begins at node 960 and 980 (elbow to elbow, reference 4.5 page 25). Further review (Reference 4.5, Attachment J, Sheet J12) shows that piping run 970 to 975 provides the closest elevation (4.66 ft above the floor) and consequently Node 975 represents the flaw loading conditions.

Normal Operation

Reference 4.9, paragraph 102.3.2, requires that the sum of the longitudinal stresses due to pressure, weight and other sustained loads not exceed S_h.

Attachment J Sheet 597 provides a longitudinal sustained stress which includes due to longitudinal pressure plus sustained load for node 975 of 919 psi. The implied moment that produces this stress (conservatively treating longitudinal pressure stress as bending stress) can be calculated as follows:

S = M/Z or M = S*Z where;

S = stress due to longitudinal sustained load for node 975 of 919 psi
M = applied moment, in-lb
Z = section modulus, in^3, = $\pi(D_o^4 - d^4)/32D_o$

For the nominal pipe,

$Z = \pi[(24\ in)^4-(22.624 in)^4] / (32*24\ in) = 285.5\ in^3$

$M = 919\ psi * 285.5\ in^3 = 262{,}375$ in-lb

Using the applied moment, M, and allowable stress value of 15,000 psi, the minimum diameter can be determined.

$Z = M/S = 356{,}590$ in-lb / 15,000 psi = $17.917\ in^3$

Solving the section modulus expression for d (in) provides;

$d = (D_o^4 - 32D_oZ/\pi)^{1/4}$

$d = [(24\ in)^4- 32*(24\ in)*(17.917\ in^3)/\pi)]^{1/4} = 23.920$ in

This provides a $t_{min} = (D_o-d)/2 = (24\ in - 23.920\ in)/2 = 0.040$ in.

Upset Conditions

To determine the minimum thickness of the pipe for upset conditions, the sum of the longitudinal and bending loads including pressure, dead weight and seismic (OBE) were considered. In determining t_{min} for this loading combination, the stress allowable was 18,000 psi or 1.2 S_h and the applied stresses were treated as applied bending moment.

Attachment J Sheet 597 provides a stress due to longitudinal pressure plus sustained load plus occasional loads (OBE) for node 975 of 1249 psi. The implied moment that produces this stress (conservatively treating longitudinal pressure stress as bending stress) can be calculated as follows:

$S = M/Z$ or $M = S*Z$ where;

S = stress due to longitudinal sustained load plus occasional loads (OBE) for node 975 of 1249 psi
M = applied moment, in-lb
Z = section modulus, in^3, $= \pi(D_o^4 - d^4)/32D_o$

For the nominal pipe,

$Z = \pi[(24\text{ in})^4-(22.624\text{in})^4] / (32*24\text{ in}) = 285.5\text{ in}^3$

$M = 1249\text{ psi} * 285.5\text{ in}^3 = 356{,}590\text{ in-lb}$

Using the applied moment, M, and allowable stress value of 18,000 psi, the minimum diameter can be determined.

$Z = M/S = 356{,}590\text{ in-lb} / 18{,}000\text{ psi} = 19.811\text{ in}^3$

Solving the section modulus expression for d (in) provides;

$d = (D_o^4 - 32D_oZ/\pi)^{1/4}$

$d = [(24\text{ in})^4- 32*(24\text{ in})*(19.811\text{ in}^3)/\pi)]^{1/4} = 23.912\text{ in}$

This provides a $t_{min} = (D_o-d)/2 = (24\text{ in} - 23.912\text{ in})/2 = 0.044\text{ in}$.

Faulted Conditions

To determine the minimum thickness of the pipe for upset conditions, the sum of the longitudinal and bending loads including pressure, dead weight and seismic (DBE) were considered. In determining t_{min} for this loading combination, the stress allowable was 32,380 psi or S_y and the applied stresses were treated as applied bending moment.

Attachment J Sheet 623 provides a stress due to longitudinal sustained load plus occasional loads (OBE) for node 975 of 1544 psi. The implied moment that produces this stress (conservatively treating longitudinal pressure stress as bending stress) can be calculated as follows:

$S = M/Z$ or $M = S*Z$ where;

S = stress due to longitudinal pressure plus sustained load plus occasional loads (DBE) for node 975 of 1544 psi
M = applied moment, in-lb
Z = section modulus, in^3, $= \pi(D_o^4 - d^4)/32D_o$

For the nominal pipe,

$Z = \pi[(24\ in)^4-(22.624in)^4] / (32*24\ in) = 285.5\ in^3$

$M = 1249\ psi * 285.5\ in^3 = 440{,}812$ in-lb

Using the applied moment, M, and allowable stress value of 32,380 psi, the minimum diameter can be determined.

$Z = M/S = 440{,}812\ in\text{-}lb / 32{,}380\ psi = 13.614\ in^3$

Solving the section modulus expression for d (in) provides;

$d = (D_o^4 - 32D_oZ/\pi)^{1/4}$

$d = [(24\ in)^4- 32*(24\ in)*(13.614\ in^3)/\pi)]^{1/4} = 23.939$ in

This provides a $t_{min} = (D_o\text{-}d)/2 = (24\ in - 23.939\ in)/2 = 0.031$ in.

The maximum t_{min} for longitudinal stresses is 0.044 in., which is less than the Code minimum, t_m = 0.080 inch (From Reference 4.9, $t_m = P*D_o/2(SE+P*y)+A =$ 100 psi* 24 in./ 2(15,000 psi + (100 psi*0.4)) = 0.080) required for pressure design. Therefore, the controlling t_{min} was determined to be 0.080 inch.

A flaw length (2a) of 3 inches will be assumed. Based upon review of Attachment 4, the minimum measured pipe thickness (t_{meas}) for use in the fracture mechanics analysis can be estimated to be approximately 0.620 inch. This represents the lowest value wall thickness outside the postulated flaw area. Note that the nominal pipe thickness is 0.688 inches and 87.5% of the pipe nominal thickness is 0.602 inches representing the minimum manufacturers pipe thickness. Since the remaining pipe section is greater than 0.602 inch, the stresses provided by the B31.1 pipe stress analysis are adequate.

The applied stress, s, was determined from review of the B31.1 piping stress analysis (Reference 4.5). The applied stress, s, at the flawed location (Node 975) is the combination of dead weight, pressure, thermal expansion and design basis earthquake (DBE).

Dead weight + pressure + DBE = 1544 psi =1.544 ksi (Reference 4.5, Attachment J, Sh. J623)

The thermal expansion stress was obtained based upon the maximum value of bending stress from the parametric of hot run values performed in Reference 4.5. The maximum thermal stress at node 975 was determined to be "A & C Hot".

Thermal Expansion Stress = 1109 psi = 1.109 ksi (Reference 4.5, Attachment J, Sh. J240.)

The Total Applied Bending Stress, s, = 1.544 ksi + 1.109 ksi = 2.653 ksi

Computing values,

$$R = (24 \text{ in}/2) - (0.62 \text{ in}/2) = 11.69 \text{ in}$$

$$r = 11.69 \text{ in} / 0.62 \text{ in} = 18.855 \text{ in}$$

$$A = -3.26543 + 1.52784*18.855 - 0.072698*(18.855)^2 + 0.0016011*(18.855)^3 = 10.4294$$

$$B = 11.36322 - 3.91412*18.855 + 0.18619*(18.855)^2 - 0.004099*(18.855)^3 = -23.721$$

$$C = -3.18609 + 3.84763*(18.855) - 0.18304*(18.855)^2 + 0.00403*(18.855)^3 = 31.6959$$

Given a = 1.50 in, then c= 1.50 in /(3.1416*11.69 in) = 0.040844

Calculating the Shape Factor , F,

$$F = 1 + 10.4294*(0.040844)^{1.5} + (-23.721)*(0.040844)^{2.5} + 31.6959*(0.040844)^{3.5} = 1.0785$$

Computing K,

$K = 1.4 * 2.653 \text{ ksi} * 1.0785 * (3.1416 * 1.50 \text{ in})^{0.5} = 8.70 \ (\text{ksi}\sqrt{\text{in}})$

Given that the material is a ferritic steel, the lower bound fracture toughness provided by reference 4.2 is 35 ksi√in. Since the applied stress intensity factor is less than the available fracture toughness of 35 ksi√in, crack extension is not expected to occur and structural integrity will be maintained for all the design loads including earthquake.

8.0 SUMMARY OF RESULTS

The flaw found in service water piping line 24-JGD-6, spool piece SK-923, was evaluated for structural integrity using the methods provided by Generic Letter 90-05. This method uses linear elastic fracture mechanics to determine an applied stress intensity factor using all the design loads with DBE and compares it to a lower bound fracture toughness. The applied stress intensity factor of 8.7 ksi√in is less than the available fracture toughness of 35 ksi√in, crack extension is not expected to occur and structural integrity will be maintained for all the design loads including earthquake.

Calculation Review Comment and Resolution Form

(Sheet 1 of ~~1~~ 2 GAG 3/13/00)

Calculation Number: 00-CP-02958M2 Revision: 01 CCN N/A

Calculation Title: Structural Integrity of Flaw Found in Service Water Line24-JGD-6

Calc. Originator: C. Stewart Reviewer (PRINT): Glenn A. Gardner

This form is intended to document significant comments and their resolutions. Typographical errors and other editorial recommendations may be marked up in the calculation text and presented to the originator

Review Type ☞ ☐ **Interdiscipline** ☒ **Independent**

Reviewer (SIGN) Glenn A Gardner Date: 3/13/00

(signature signifies all comments have been resolved to your satisfaction)

Item	Page/Section	Comments	Response
1	all	Reviewed all pages with only minor editorial comments, incorporated In addition, prepared alternative evaluation attached.	N/A

P. 13 of 26

Alternative Evaluation of Non-Planar Through-Wall Flaw

This evaluation of the subject flaw is prepared as an alternative to the evaluation performed in accordance with GL 90-05.

ASME Code Case N-597 has been accepted as an alternative by the NRC per letter dated 2/23/1999 for use on Millstone Units 2 and 3. In this case, paragraph -3500(5)(f) states that for low energy Class 3 piping exhibiting through-wall leakage, "evaluation methods and acceptance criteria shall be specified by the Owner." No further requirements are provided.

A reasonable approach for relatively small through-wall flaws in ductile piping materials is the branch reinforcement rules and acceptance criteria as given in the original construction Code, which is ANSI B31.1-1967 for this piping. The Code approach for branch connections is basically an area replacement evaluation, in which the area lost by cutting the hole for the branch piping is compensated for by existing or added reinforcing material surrounding the hole. Any pipe wall thickness not needed for pressure boundary integrity is considered available for reinforcement. A non-planar through-wall flaw is structurally similar to the lost pipe wall area cut out for a branch connection. The Code rules and criteria are specified in paragraph 104.3, "Intersections", in parts 2(b) and 2(c) and are illustrated in Figure 104.3.1(d).

For the subject flaw with an assumed effective diameter of 3.0", per 104.3(2)(b) the required reinforcing area, A_{req} is

$$A_{req} = 1.07\ t_{mh} d_1$$

where t_{mh} is the header pipe minimum required wall thickness for design pressure, determined in this calculation as 0.080 inches, and d_1 is 3.0 inches as assumed

$$A_{req} = (1.07)(0.080)(3.0) = 0.26 \text{ inches}^2$$

The available reinforcing area, considering both sides of the flaw, is calculated as

$$A_1 = (d_2)(T_h - \text{mill tolerance} - t_{mh})$$

where for 'T_h - mill tolerance" we will use the measured wall thickness adjacent to the flaw, 0.62 inches, d_2 is equal to d_1, and t_{mh} is as stated above

$$A_1 = (3.0)(0.62 - 0.080) = 1.62 \text{ inches}^2$$

Since the available reinforcing area greatly exceeds the required reinforcing area:

$$A_1 = 1.62 > A_{req} = 0.26 \text{ inches}^2,$$

the branch reinforcement rules of B31.1 are effectively satisfied and the through-wall flaw is considered structurally stable.

The piping stresses for longitudinal pressure + deadload + DBE loadings at node 970 was calculated as 1,711 psi in the design basis calculation (page J196), compared to an allowable of 34,380 psi (page 62). Since the through-wall flaw constitutes a relatively small reduction in the piping cross section the presence of the flaw is not significant.

In conclusion, the flaw is acceptable from a structural standpoint and occurs at a location of low service stress. Therefore it is acceptable for continued operation.

ATTACHMENT 1 - EXAM DATA SHEET

Northeast Nuclear Energy

ULTRASONIC EXAMINATION
STRAIGHT BEAM MEASUREMENTS

Plant	Millstone Unit II	Page	1 of 1
System & Zone	2326A	Exam Data Sheet No.	N/A
Component ID	SK0923	AWO Number	M2-00-00899
Component Description	VERT. Straight Pipe	Drawing No	25203-20150 SH. 106
Examination Purpose	Eng. Info	Line No	24"-JGD-6

Instrument & Settings	
Manufacturer	PANA.
Model No	26 DL Plus
Serial No	92097812
Range	1.000"
Velocity	.233 μs
Delay	N/A
Zero Value	4.94 μs
Cal Tolerance	± .005"

Calibration Block(s)		
Type	Serial No.	Material
Step blk.	91-5932	CS
Step blk.	91-6373	CS

Component Data	
Component T_{nom}	
Component Dia.	24"
Attachments	.688"

Calibration Checks		Block Thickness		Instrument Reading	
Type	Time	Min.	Max	Min.	Max.
Initial	1445	.100"	.750"	.100"	.750"
Intermediate	N	N		N	
Intermediate	A		A		A
Final	1510	.100"	.750"	.100"	.750"

Search Unit Data	
Manufacturer	PANA.
Type No.	D791-RM
Serial No.	19510
Frequency	5 MHZ.
Size	.312"

Couplant Data	
Brand	Soundsafe
Batch No.	99120B
MRIR/UTC No.	000038721I

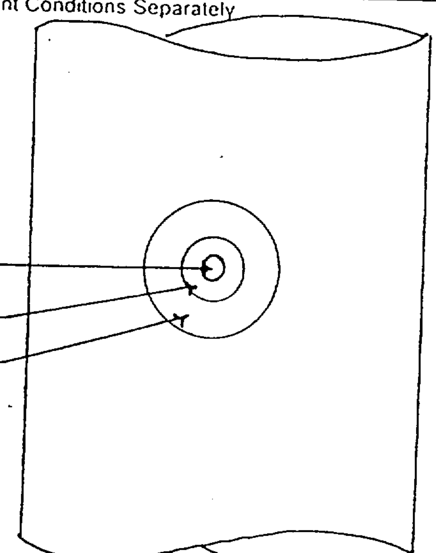
Coatings Factor Data	
Surface Painted	yes
ACT* mils =	*
ACT X 3 mils =	

* Average Coating Thickness

Sketch/Comments Area - Attach Photo(s) of Relevant Conditions Separately

Performed UT Scan of 2 Areas around Blistered Paint, recorded a UT thickness range in 2" Area of .060" - .260"

12" Area ~~.696~~ MCB .676 " - .694"



1/2" dia. Blistered Paint
2" dia. .060" - .260
12" dia. .676" - .694"

* No Paint thickness data taken due Area requiring A Mechanical Patch Based on initial UT, per Eng.

Examiner (print & sign) Michael Brehler / Michael Brehler Level II L Date 1/18/00
Reviewer (sign) [signature] Level III Date 1/19/00
ANII if Required (sign) N/A Date

Level of Use Information

STOP THINK ACT REVIEW

ATTACHMENT 1 - EXAM DATA SHEET

Northeast Nuclear Energy

ULTRASONIC EXAMINATION
STRAIGHT BEAM MEASUREMENTS

Plant	MP	Unit	2
System & Zone No.	2326A	Page	1 of 2
Component ID	SK0923	Exam Data Sheet No.	N/A
Component Description	SPOOL - FROM RBCCW HXR	AWO Number	M2-00-00924
Examination Purpose	INFORMATIONAL	Drawing No.	25203-20194-923
		Line No.	24-JGD-6

Instrument & Settings	
Manufacturer	PANA.
Model No.	26 DL Plus
Serial No.	91034408
Range	1.0"
Velocity	233 µs
Delay	N/A
Zero Value	489 µs
Cal Tolerance	± .005"

Calibration Block(s)		
Type	Serial No.	Material
Step Blk.	91-6475	CS
Step Blk.	91-6469	CS

Component Data	
Component Tnom	.688"
Component Dia.	24"
Attachments.	N/A

Calibration Checks		Block Thickness		Instrument Reading	
Type	Time	Min.	Max.	Min.	Max.
Initial	1830	.100"	1.000"	.100"	1.000"
Intermediate	N/A	N/A		N/A	
Intermediate					
Final	1905	.100"	1.000"	.100"	1.000"

Search Unit Data	
Manufacturer	PANA.
Type No.	D791-RM
Serial No.	129816
Frequency	5 MHZ
Size	.312"

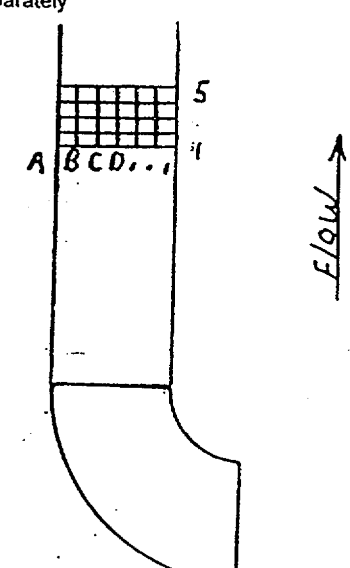
Couplant Data	
Brand	Soundsafe
Batch No.	99120 B
MRIR/UTC No.	0000387211

Coatings Factor Data	
Surface Painted	yes
ACT* mils =	10.3
ACT X 3 mils =	30.9

* Average Coating Thickness

Sketch/Comments Area - Attach Photo(s) of Relevant Conditions Separately

Performed Grid + UT
Around Pipe in leak Area.
2" Grid A1 - AL5
See Attached For
UT data.



Examiner (print & sign)	Michael Brehler / Michael Buhler	Level III L	Date 1/19/00
Reviewer (sign)	N Mueller	Level III	Date 1/20/00
ANII if Required (sign)	N/A		Date N/A

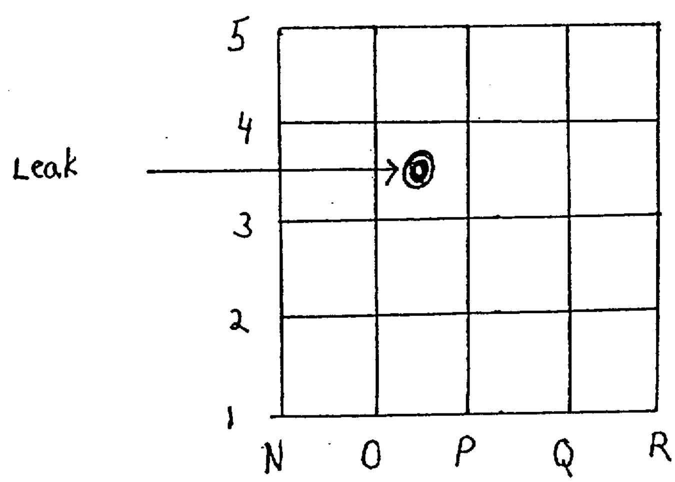
Main Section (0)

Rows : 5 Cols : 38 Direction : Clockwise Offset : 0

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	0.694	0.699	0.690	0.687	0.690	0.686	0.697	0.697	0.684	0.700	0.692	0.698	0.698	0.700	0.692	0.685	0.687	0.692	0.691	0.689	0.685
2	0.688	0.692	0.685	0.687	0.684	0.683	0.691	0.694	0.688	0.690	0.698	0.697	0.704	0.700	0.695	0.691	0.693	0.692	0.691	0.690	0.690
3	0.688	0.686	0.689	0.690	0.688	0.683	0.691	0.699	0.694	0.698	0.712	0.706	0.701	0.703	0.662	0.653	0.693	0.695	0.698	0.693	0.691
4	0.687	0.695	0.685	0.686	0.687	0.684	0.695	0.696	0.689	0.691	0.700	0.691	0.719	0.706	0.689	0.636	0.687	0.693	0.691	0.690	0.686
5	0.695	0.687	0.679	0.671	0.659	0.680	0.686	0.680	0.691	0.684	0.690	0.698	0.700	0.695	0.689	0.688	0.687	0.687	0.690	0.690	0.684
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
ColMx	0.695	0.699	0.690	0.690	0.690	0.686	0.697	0.699	0.694	0.700	0.712	0.706	0.719	0.706	0.695	0.691	0.693	0.695	0.698	0.693	0.691
ColMn	0.687	0.686	0.679	0.671	0.659	0.680	0.686	0.680	0.684	0.684	0.690	0.691	0.698	0.695	0.662	0.636	0.687	0.687	0.690	0.689	0.684
Delta	0.008	0.013	0.011	0.019	0.031	0.006	0.011	0.019	0.010	0.016	0.022	0.015	0.021	0.011	0.033	0.055	0.006	0.008	0.008	0.004	0.007
Ave	0.690	0.692	0.686	0.684	0.682	0.683	0.692	0.693	0.689	0.693	0.698	0.698	0.704	0.701	0.685	0.671	0.689	0.692	0.692	0.690	0.687

	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
1	0.687	0.686	0.688	0.692	0.693	0.694	0.699	0.708	0.691	0.681	0.690	0.688	0.694	0.687	0.685	0.693	0.694
2	0.691	0.696	0.692	0.689	0.691	0.695	0.706	0.696	0.697	0.692	0.696	0.689	0.688	0.690	0.688	0.688	0.695
3	0.690	0.692	0.689	0.690	0.691	0.699	0.709	0.709	0.701	0.690	0.689	0.690	0.689	0.686	0.686	0.689	0.699
4	0.689	0.692	0.687	0.688	0.692	0.682	0.705	0.695	0.698	0.691	0.690	0.685	0.691	0.689	0.693	0.685	0.682
5	0.686	0.685	0.683	0.687	0.690	0.687	0.692	0.695	0.690	0.692	0.692	0.691	0.685	0.689	0.692	0.683	0.687
	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
ColMx	0.691	0.696	0.692	0.692	0.693	0.699	0.709	0.709	0.701	0.692	0.696	0.691	0.694	0.690	0.693	0.693	0.699
ColMn	0.686	0.685	0.683	0.687	0.690	0.682	0.692	0.695	0.690	0.681	0.689	0.685	0.685	0.686	0.685	0.683	0.682
Delta	0.005	0.011	0.009	0.005	0.003	0.017	0.017	0.014	0.011	0.011	0.007	0.006	0.009	0.004	0.008	0.010	0.017
Ave	0.689	0.690	0.688	0.689	0.691	0.691	0.702	0.701	0.695	0.689	0.691	0.689	0.689	0.688	0.689	0.688	0.691

	RowMx	RowMn	Delta	Ave
1	0.708	0.681	0.027	0.692
2	0.706	0.683	0.023	0.692
3	0.712	0.653	0.059	0.692
4	0.719	0.636	0.083	0.690
5	0.700	0.659	0.041	0.687



Section Summary

Maximum Reading = 0.719 (4, M) Average = 0.691

Minimum Reading = 0.636 (4, P) Standard Deviation = 0.692

Total Readings = 190

ATTACHMENT 1

Northeast Nuclear Energy

COATING THICKNESS EXAM DATA SHEET

Plant MP Unit 2	Design DWG Number 25203-20194-923
System 2326A Zone N/A	Component Description SERV WATER FROM RECCW
AWO No. M2-00-00924	Component Identification SK-0924
Exam. Purpose Eng. Info.	Pipe Size 24 INCH
Thickness Meter	Micrometer
Make/Model Fischer/Deltascope	Micrometer PMMS No. 1682
RE/PMMS No. N/A	Serial Number 1682
Serial Number 042-12554A	Calibration Due Date 2-13-00
Calibration Range 2.93 - 25.8 Mils	

Readings

1	10.4	11	8.77	21	7.16
2	7.43	12	10.7	22	8.92
3	11.1	13	9.59	23	10.3
4	9.09	14	10.6	24	12.9
5	11.3	15	7.78	25	12.8
6	13.0	16	12.1	26	10.9
7	13.9	17	8.70	27	9.07
8	11.2	18	9.51	28	11.9
9	9.06	19	7.99	29	11.2
10	10.9	20	11.3	30	10.8

Coating Thickness Minimum 7.16 Maximum 13.9 Average 10.3

Comments

N/A

Examiner (print & sign) Michael Brehler / Michael Brehler	Level II L	Date 1/19/00
Reviewer (print & sign) R.J. Fuller / R Fuller	Level III	Date 1/20/00
Engineering Reviewer (print & sign) N/A	Level N/A	Date N/A
ANII (when applicable) N/A		Date N/A

Level III or Designee Signature for Certification ____ Date ____

Safety Evaluation Screen Form [♣Comm. 4.1.6]

(Sheet 1 of 4)

Unit 2 **Document No.** 00-CP-02598M2 **Revision No.** 00 **Change No.** ~~NZ~~ NA 1/24/..

(Attachment 6 Provides Guidance)

A. SUMMARY INFORMATION *(Completed by the Preparer)*

1. **Description of the Proposed Change, Test or Experiment**

A degraded condition exists in Unit 2 service water piping spool piece, as documented in CR M2-00-0155. The degraded condition is a localized corrosion of the pipe pressure boundary, resulting in loss of pressure boundary thickness including a small region that is through-wall and permits leakage of service water. The degraded pipe wall is limited to a region about 2 inches in diameter. As permitted by NRC Generic Letter 90-05, an evaluation has been performed in accordance with criteria stated in the letter, with the conclusion that the flaw will remain structurally stable until a Code repair or replacement can be performed at the next outage.

This safety evaluation screening is prepared relative to the determination of the flaw's structural integrity as documented in this calculation. The calculation and this screen do not address the compensatory actions to limit leakage or any other aspects of compliance with GL 90-05; these aspects are considered in DCN DM2-00-0039-00.

B. SCREENING QUESTIONS *(Completed by the Preparer)*

1. **Will implementation of the proposed Change, Test or Experiment require a revision to the Operating License or the Technical Specifications?** *(If "Yes," complete (a.), go to Section D and sign as Preparer - prior NRC review and approval is required. If "No," complete (b) and go to Question 2.)*

☐ Yes *(OL or T/S change required)* ☒ No

a. *Reason OL or T/S change required and sections impacted:*

b. *Reason OL or T/S change not required and sections reviewed:*

Evaluation of degraded piping for continued operation is permitted by the NRC in accordance with GL 90-05. The process requires submittal of the evaluation to the NRC and is subject to NRC review and approval. A GL 90-05 request was most recently submitted for Unit 2 in 1994 under letter B14776. There are no licensing provisions or commitments which prohibit implementing the process at Millstone. Therefore the GL 90-05 evaluation is in accordance with the licensing basis, and no change to the license is required.

Reviewed OL and T/S through change 253, T/S section 3/4.4.10.

Searched Licensing Commitment Database keywords "90-05", "flaw", "leak"

2. **Is the proposed Change, Test or Experiment fully bounded by the scope of a previously approved Safety Evaluation?** *(Refer to Section B.2 of Attachment 6 to determine if fully bounded. If "Yes," complete (a.) and (b.), go to Section D and sign as Preparer - a new SE is not required. If "No," go to Question 3.)*

☐ Yes *(new SE not required)* ☒ No

a. *Identification of previously approved SE:*

b. *Reason previously approved SE fully bounds proposed activity:*

Safety Evaluation Screen Form [♣Comm. 4.1.6]

(Sheet 2 of 4)

Unit 2 **Document No.** 00-CP-02598M2 **Revision No.** 00 **Change No.** ~~NZ~~ NA AA 1/24/00

3. **Is it obvious that the proposed Change, Test or Experiment requires a Safety Evaluation?** *(If "Yes," a SE is required – complete (a.), go to Section D and sign as Preparer. If "Not Obvious," go to Question 4. If it is not clear, a SE is required.)*

   ☐ Yes *(SE required)* ☒ Not Obvious

   a. *Reason SE required:*

4. **Does the proposed activity meet the criteria of a Non-Intent Change to the Facility or procedures as described in the SAR?** *(Refer to the guidance in Section B.4 of Attachment 6 to determine if Non-intent. If a Non-intent Change, check "Yes," complete (a.) go to Section D, and sign as Preparer - a SE is not required. If "No," go to Question 5.)*

   ☐ Yes *(SE not required)* ☒ No

   a. *Reason SE not required and SAR sections reviewed:*

5. **Will implementation of the proposed activity modify the Facility as described in the SAR?** ***(Per the guidance in Section B.5 of Attachment 6, ensure that you check "Yes" if the proposed activity could directly or indirectly as a result of a system interaction, introduce different failure modes or affect the function or reliability of equipment described in the SAR.*** *If "Yes," complete (a.), go to Section D and sign as Preparer. - a SE is required. If "No," complete (b.) and go to Question 6.)*

   ☐ Yes *(SE required)* ☒ No

   a. *Reason SE required and SAR sections impacted:*

   b. *Basis for "No" and SAR sections reviewed:*

   The flaw has been identified as a degraded condition under Millstone's corrective actions program, which meets the requirements of 10CFR 50 Appendix B. Since the flaw is scheduled for corrective action at the next available outage of sufficient duration, by the guidance provided in Generic Letter 91-18 Rev.1 the flaw itself is not required to be considered a plant change for the purpose of 10CFR 50.59 evaluations.

   Reviewed UFSAR through change 57, 7/16/99, Section 9.7, and TRM through change 53, 1/6/00.

6. **Will implementation of the proposed activity modify procedures as described in the SAR?** *(Refer to the list of supplemental questions in Section B.6 of Attachment 6 to evaluate the need for a SE. If "Yes," complete (a.), go to Section D and sign as Preparer - a SE is required. If "No," complete (b.) and go to Question 7.)*

   ☐ Yes *(SE required)* ☒ No

   a. *Reason SE required and SAR sections impacted:*

   b. *Basis for "No" and SAR sections reviewed:*

   The evaluation of the flaw was performed consistent with the existing procedure for GL 90-05 evaluations, specification SP-ST-ME-947 Rev. 1. There are no procedural

Safety Evaluation Screen Form [♣Comm. 4.1.6]

(Sheet 3 of 4)

Unit 2 **Document No.** 00-CP-02598M2 **Revision No.** 00 **Change No.** ~~NZ~~ NA AK 1/26/00

changes required for evaluation of the flaw. Therefore there are no required changes to procedures as described in the SAR.

Reviewed UFSAR through change 57, 7/16/99, Chpt. 12 and Section 9.7, and TRM through change 53, 1/6/00.

7. **Will implementation of the proposed activity involve a Test or Experiment *not* described in the SAR?** *(Refer to the list of examples in Section B.7 of Attachment 6 to determine the need for a SE. If "Yes," complete (a.), go to Section D and sign as Preparer - a SE is required. If "No," complete (b.), go to Section D and sign as Preparer.)*

   ☐ Yes *(SE required)* ☒ No

   a. *Reason SE required:*

   b. *Basis for "No" and SAR sections reviewed:*

   Evaluation of the flaw is a technical activity that does not itself affect operation of the plant. The evaluation activity does not require operation of the plant in any specified manner, and there are no required plant parameter changes. Therefore there is no Test or Experiment associated with the flaw evaluation.

   Reviewed UFSAR through change 57, 7/16/99, Chpt. 13 and Section 9.7, and TRM through change 53, 1/6/00.

C. SUMMARY *(Completed by the Approver)*

1. **Is a revision to the technical specifications or operating license required?** *("Yes, if Question B.1 checked "Yes")*

   ☐ Yes ☑ No

2. **Is a Design Engineering Screening Evaluation per the Design Change Manual Required?** *(Yes, if proposed Change is an Intent Change to the Facility as described in the SAR)*

   ☐ Yes ☑ No ☐ Not Applicable

3. **Is a new Safety Evaluation required?** *(Yes, if Question B.1, B.3, B.5, B.6 or B.7 is checked "Yes")*

   ☐ Yes ☑ No

4. **Is a FSARCR per RAC 03 necessary?** *(Yes, if responses to Question B.5 or B.6 indicate proposed activity will cause the FSAR description to be incorrect)*

   ☐ Yes ☑ No ☐ Not Applicable

5. **Is the proposed activity fully bounded by a previously approved Safety Evaluation?** *(Yes, if Question B.2 is checked "Yes")*

   ☐ Yes ☑ No

6. **Is the Quality Assurance Plan, Emergency Plan or Security Plan affected, requiring an evaluation per RAC 01?** *(Yes, if response to Question B.5, B.6, or B.7 identifies these portions of the SAR as being affected by the proposed activity)*

   ☐ Yes ☑ No ☐ Not Applicable

Safety Evaluation Screen Form [♣Comm. 4.1.6]

(Sheet 4 of 4)

Unit 2 **Document No.**00-CP-02598M2 **Revision No.** 00 **Change No.** ~~NZ~~ NA 1/24/00

D. APPROVAL

Preparer: GLENN A. GARDNER [signature] Date: 1/26/00
Print and Sign

Reviewer: *(if required)* N/A Date:
Print and Sign

Approver: [signature] / [signature] NELSON AZEVEDO Date: 1/26/00
Print and Sign

ATTACHMENT 1 - EXAM DATA SHEET

Northeast Nuclear Energy

ULTRASONIC EXAMINATION
STRAIGHT BEAM MEASUREMENTS

Plant MILLSTONE Unit 2	Page 1 of 3
System & Zone No 2326 A	Exam Data Sheet No N/A
Component ID SK0923	AWO Number M2-00-03495
Component Description SPOOL PIECE	Drawing No 25203-20150 SH.106
Examination Purpose ENG. INFORMATION	Line No 24" JGD-6

Instrument & Settings	
Manufacturer	PANAMETRICS
Model No.	26 DL PLUS
Serial No	92097812
Range	1.00"
Velocity	2356
Delay	N/A
Zero Value	2545
Cal Tolerance	±.005"

Calibration Block(s)		
Type	Serial No.	Material
STEP BLOCK	91-6373	C/S DUE 8-1-01
STEP BLOCK	91-6473	C/S DUE 2-19-03
STEP BLOCK	028392	C/S DUE 4-1-01

Component Data	
Component T_{nom}	.688"
Component Dia.	24"
Attachments	N/A

Calibration Checks		Block Thickness		Instrument Reading	
Type	Time	Min.	Max.	Min.	Max.
Initial	0855	.040"	.750"	.040"	.750"
Intermediate	N/A	N/A	N/A	N/A	N/A
Intermediate					
Final	0925	.040"	.750"	.040"	.750"

Search Unit Data	
Manufacturer	PANAMETRICS
Type No.	D798
Serial No.	129401
Frequency	7.5 MHZ
Size	0.2"

Couplant Data	
Brand	SOUNDSAFE
Batch No.	99120B
MRIR/UTC No.	0000387211

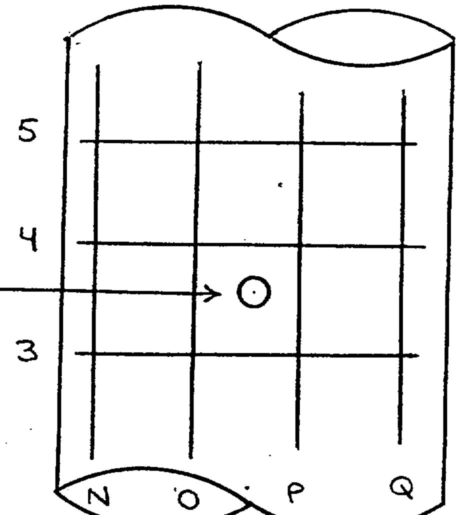
Coatings Factor Data	
Surface Painted	YES
ACT* mils =	9.94
ACT X 3 mils =	29.82

* Average Coating Thickness

Sketch/Comments Area - Attach Photo(s) of Relevant Conditions Separately

SEE ATTACHED SKETCH FOR DETAILED UT DATA.

AREA OF KNOWN LEAK →



Examiner (print & sign) TODD A. BOHNENKAMPER / [signature]	Level II	Date 3/2/00
Reviewer (sign) [signature]	Level III	Date 3/6/00
ANII if Required (sign) N/A		Date N/A

Northeast Nuclear Energy

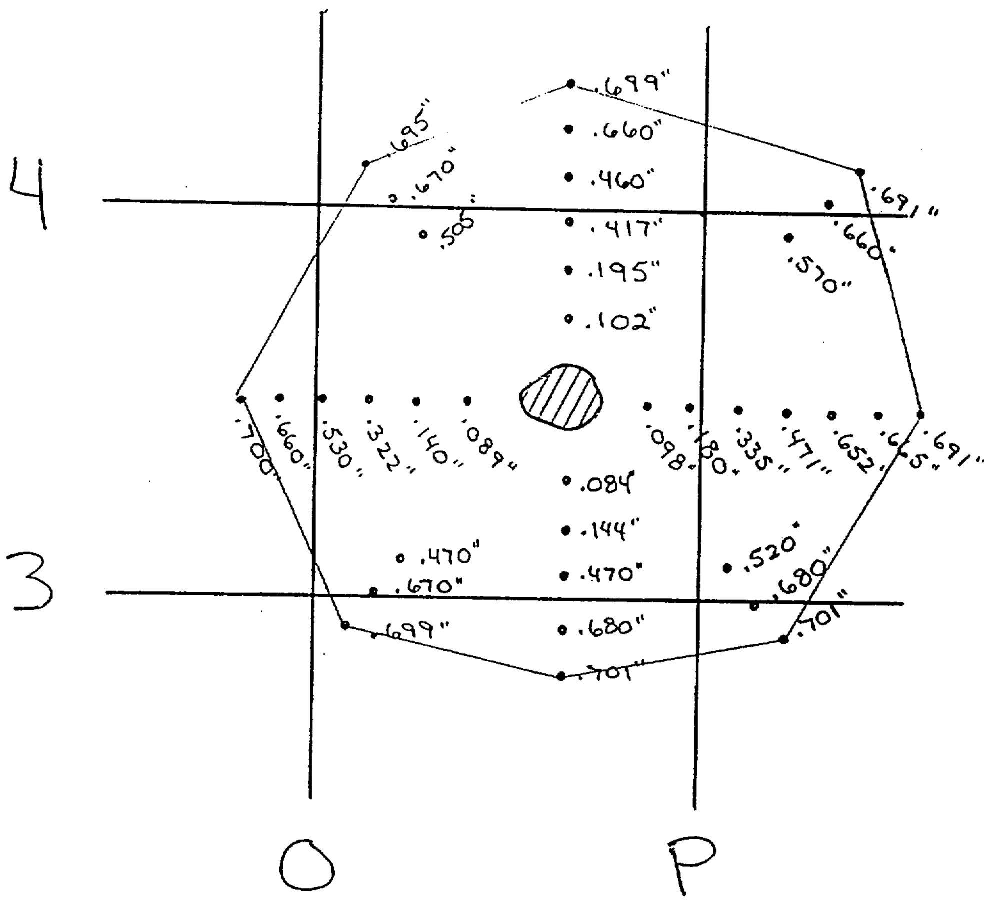
GENERIC NDE SKETCH SHEET

Page 2 of 3

Procedure No. NU-UT-5 Rev. 10 PCN N/A

Plant MILLSTONE Unit 2	Cal. Data Sheet # N/A
System 2326 A	Exam. Data Sheet # N/A
Component ID SK0923	AWO No. M2-00-03495

THICKNESS DATA OBTAINED AT 1/4" INTERVALS BEGINNING AT AREA OF LEAK. READINGS CONTINUE UNTIL T-NOM IS ACHIEVED. SKETCH IS DRAWN TO ACTUAL SIZE.



Examiner Comments REF. PREVIOUS DATA FOR ORIGINAL UT DATA.

Examiner Signature (Print/Sign) TODD BOHNENKAMPER / [signature] Level II Date 3/2/00

Reviewer (Print/Sign) R.J. Fuller [signature] Level III Date 3/6/00

ANII If Required (Sign) N/A Date N/A

ATTACHMENT 1

Northeast Nuclear Energy

COATING THICKNESS EXAM DATA SHEET

Plant: MILLSTONE Unit: 2	Design DWG Number: 25203-20150 SH 106
System: 2326 A Zone: N/A	Component Description: SPOOL PIECE
AWO No.: M2-00-03495	Component Identification: SK0923
Exam. Purpose: ENG. INFORMATION	Pipe Size: 24"

Thickness Meter		Micrometer	
Make/Model	FISCHER / DELTASCOPE	Micrometer PMMS No.	QA 2632 B
RE/PMMS No.	RE1700	Serial Number	QA 2632 B
Serial Number	042-12554 A	Calibration Due Date	3/21/00
Calibration Range	.093 - 25.8 MILS		

Readings

1	11.2	11	9.38	21	N/A
2	9.65	12	9.12	22	↓
3	9.26	13	9.85	23	
4	11.9	14	10.1	24	
5	8.92	15	12.2	25	
6	9.80	16	10.2	26	
7	9.65	17	9.46	27	
8	9.47	18	8.98	28	
9	11.0	19	9.12	29	
10	10.7	20	8.80	30	↓

Coating Thickness Minimum 8.80 Maximum 12.2 Average 9.94

Comments N/A

Examiner (print & sign)	TODD A. BOHNENKAMPER / [signature]	Level II	Date 3/2/00
Reviewer (print & sign)	R. J. Fuller [signature]	Level III	Date 3/2/00
Engineering Reviewer (print & sign)		Level	Date
ANII (when applicable)	N/A		Date N/A

Level III or Designee Signature for Certification N/A Date N/A

Northeast Nuclear Energy

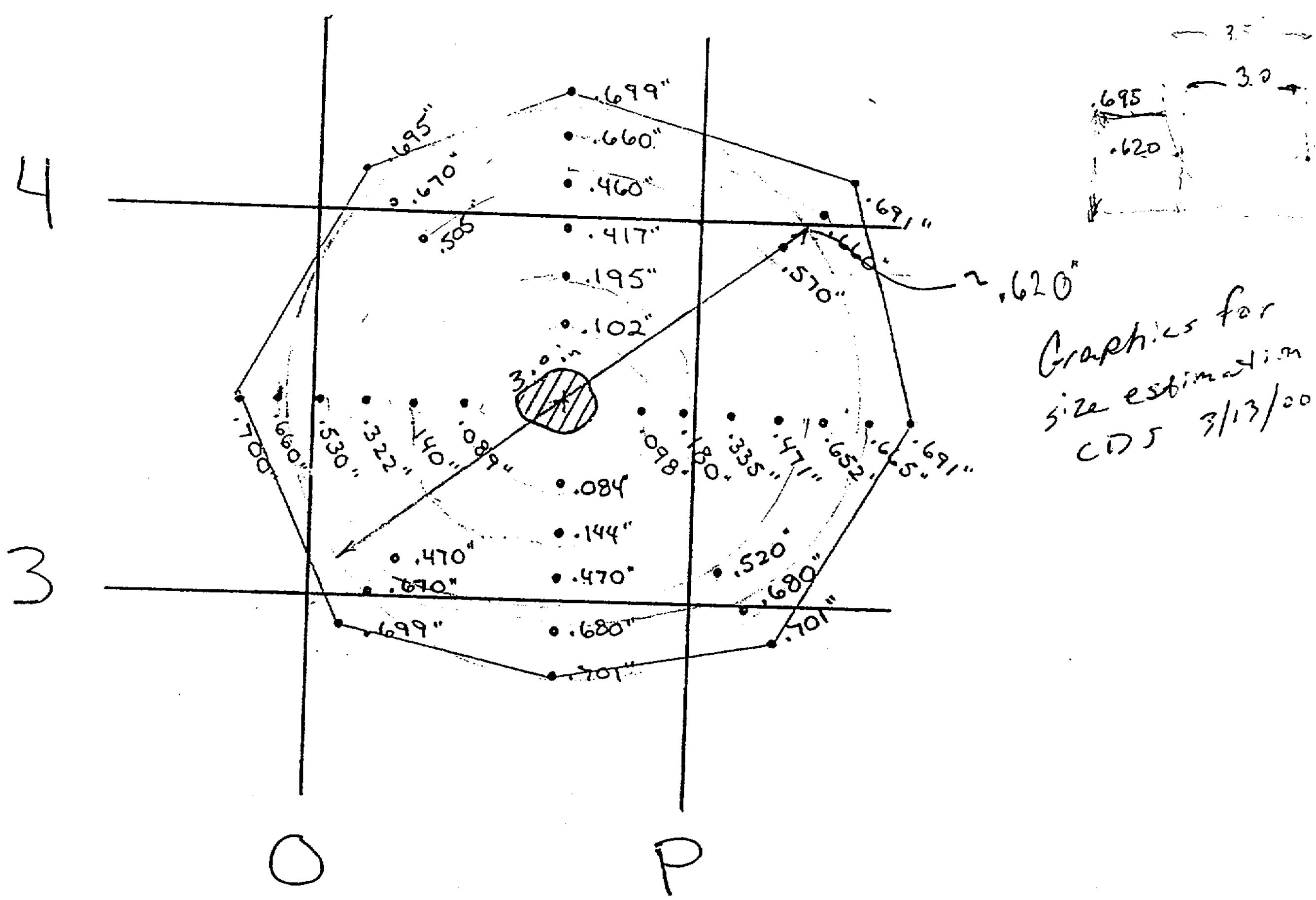
GENERIC NDE SKETCH SHEET

Page 2 of 3

Procedure No. NU-UT-5 Rev. 10 PCN N/A

Plant MILLSTONE Unit 2	Cal. Data Sheet # N/A
System 2326 A	Exam. Data Sheet # N/A
Component ID SK0923	AWO No. M2-00-03495

THICKNESS DATA OBTAINED AT 1/4" INTERVALS BEGINNING AT AREA OF LEAK. READINGS CONTINUE UNTIL T-NOM IS ACHIEVED. SKETCH IS DRAWN TO ACTUAL SIZE.



Examiner Comments REF. PREVIOUS DATA FOR ORIGINAL UT DATA.

Examiner Signature (Print/Sign) TODD BOHNENKAMPER [signature] Level II Date 3/2/00

Reviewer (Print/Sign) R.J. Fuller [signature] Level III Date 3/6/00

ANII If Required (Sign) N/A Date N/A